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Short- and Long-term Impacts of Economic Policies on Child Labor and Schooling in Ghana

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Abstract

While the issue of child labor in developing countries has received increased attention in recent years, most of the empirical analysis has been based on one-time cross sectional samples. While this may give an idea of the incidence and determinants of child labor at one point in time, it is silent about the dynamics of child labor over time and sometimes may even be influencing policy choices against child labor adversely. This paper attempts to fill this void, analyzing the dynamics of child labor and schooling in Ghana, aiming at investigating the impact of broad economic reforms on child labor and schooling in the short, medium and long run. Starting from a premise that the simple – direct - relationship between poverty and child labor, which has often been seen as *the* feature of child labor, may not adequately capture the multi facetted nature of child labor, we find evidence of asymmetries in the child labor-poverty link, as well as quite complex dynamics in the evolution of child labor and schooling and their determinants over time. Most notably, child labor is found to be responsive to poverty in the short run, but not in the long run, while child schooling is unaffected by poverty in short run but responds in the medium- to long run. These results suggest that child labor acts as an economic buffer of the household in the short run, regardless of changes in the economic environment or perceptions of the latter following economic reforms, thus supporting – and refining - the poverty explanation of child labor.

JEL classification: I21, J24, O15

Keywords: Child labor, Ghana, human capital accumulation, poverty

Short- and Long-term Impacts of Economic Policies on Child Labor and Schooling in Ghana[†]

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1. Introduction

Child labor is a pervasive phenomenon in developing countries. For example, ILO estimates that there are more than 250 million child laborers between the ages of 7 and 14 in the world of whom at least 120 million are involved in work full time, ILO (1997), while UNICEF estimates suggest that as much as 400 million children are working, UNICEF (1999). At the same time, human capital has been shown to be an essential element in a sustainable growth strategy for any economy. Hence, arguably, child labor which adversely affects the accumulation of human capital is highly costly in terms of the future growth and development of a country. For equity reasons, too, it is considered highly detrimental: child labor forecloses options arising from increasing educational levels to the individual concerned, perpetuating and even widening existing inequalities in society at large. For these reasons and for the ethical repugnance the phenomenon of child labor generates, solutions are increasingly being sought by policymakers, international organizations and aid agencies, to reduce and ultimately eliminate it.

For all of these reasons, the analysis of child labor has received increased attention in recent years. While these attempts to grapple with the economics of child labor theoretically and empirically have led to some definitional and conceptual clarity, however, the existing literature suffers from various weaknesses.

First, the nature of the data sometimes makes the analysis less applicable to child labor than could be desired, simply because the analysis of child labor was not on the agenda of the designers of the survey. Thus, researchers have often had to merely use a survey for analyzing child labor, which in most cases did not try to gather information specifically for

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the analysis of child labor. Clearly, policy advice from surveys plagued with such data problems are not useful. Indeed, it may even be harmful to the understanding of the nature of child labor and its eradication.

Second, related to this is the fact that most analyses of child labor are based on a single cross-section. However, child labor is inherently dynamic, its structure and composition being likely to change over time in developing countries as a response to reforms promoting higher growth and increased economic and human development. There are significant differences in the nature and characteristics of different kinds of child labor across space and time – their causes and consequences also differ.[1] It is crucial to recognize this essential characteristic of the phenomena from the point of view of correct policy and the efficient use of scarce public resources for amelioration of the problem. However, little work has been done so far on analyzing the dynamics of child labor.

This study is a preliminary undertaking to understand child labor as a multi-dimensional dynamic phenomenon, linked to child schooling, in the context of broad economic policies undertaken by developing countries focusing on the experience of Ghana. In particular, we conjecture that the popular belief of a simple, possibly linear, relationship between the welfare or poverty of the household and child labor is far too simplistic. Child labor is a multi-dimensional phenomenon, in particular, it cuts through time, as well as through space. Also, child labor is likely to be influenced by the overall (macro) economic conditions. In particular, the incidence of and determinants of child labor may be expected to be affected by economic growth and, thus, indirectly, by economic policies aimed at fostering growth.

With this in mind, we propose the following three hypotheses to be tested in the analysis of incidence and determinants of child labor and schooling in Ghana over time: (1) the short-, medium- and long-run responses of child labor and schooling from economic policies are likely to differ. In particular, in the short run, the policies may have no impact and/or not be credible. Hence, child labor and schooling may be unaffected in the short run, but may respond in the medium- to long run. Specifically, we suggest that the incidence of child labor will decline over time in response to economic policies, aimed at economic growth and eradication of child labor. On the other hand, such policies - coupled with policies to

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[1] See Parsons and Goldin (1989) for a study of late 19th century US.

strengthen education – are likely to affect schooling in the long run, though possibly not in the short run. Related to this first hypothesis is (2) the relative importance of the determinants of child labor are likely to change over time. In particular, child labor would seem to be more responsive to poverty in the short run, while non-responsive in the long run, due to the fact that in the short run, households would want to use child labor as a buffer against economic shocks to the households, whereas in the long run, once the changes in the economic environment from the economic reforms have materialized, the household will be less prone to use child labor as a buffer against economic shocks. Similarly, related to this is the conjecture that (3) the relative importance of the determinants of child schooling are likely to change over time, and in opposite directions of those of child labor: in the short run, child schooling would seem to be unresponsive to changes in the poverty status of the household, due to the use of child labor as a buffer against economic shocks to the households in the short run, implying that children will be withheld from school in the short run, despite changes in the economic environment or in the perceptions of the economic environment. The changed poverty status of the household has to fully materialize, after which child schooling will then adjust.

Note that child labor and child schooling are not merely each others mirror images. Most notably, children may be idle, doing neither[2] (so-called "loafing" children) or do both. Also, the determinants of child labor and child schooling – as well as their relative magnitudes – may be different. While most notably due to the reasons discussed in hypotheses (2) and (3), such differences could also come about due to attitudes and tastes towards child labor and schooling differing across as well as within regions and/or urban/rural locations.

The paper is organized as follows: the next section motivates the paper by discussing inter-linkages between economic growth, economic reforms and child labor. Section 3 reviews issues in child labor and household decision making, which in turn serves to formalize the issues involved in capturing them in a theoretical economic model as well as its estimable, econometric counterpart in section 4. Section 5 briefly discusses the evolution of the Ghanaian economy and presents a preliminary descriptive analysis of child labor incidence, determinants and dynamics in Ghana. The econometric analysis of child labor

[2] In case of insufficient nutrition, indeed, "doing nothing" may be the optimal response.

determinants and dynamics in Ghana follows in section 6. Finally, section 7 summarizes and concludes as well as provides avenues for further research.

2. Economic Growth, Economic Reforms and Child Labor

Many developing countries in the last two decades have undertaken major economic reforms – especially stabilization and structural adjustment policies - aimed at making the structure of the economy more market oriented and conducive to sustained economic growth. Many of these reforms have been pursued in the wake of macroeconomic crises – declining output and rising inflation leading to severe setbacks economy wide. A typical package of macroeconomic reforms comprises of what has come to be known as the so called 'Washington Consensus', Broad and Cavanagh (1999).

Macroeconomic crises and even subsequent reforms do not affect all households identically. Rather their effects tend to vary across sectors of employment, income/wealth levels, geographic location, gender and age and other factors. The analysis of household responses to crises and to stabilization and structural adjustment policies has been pursued in its own right, especially the supply response of rural peasant households to changes in the prices and incomes, Binswanger (1989). Households combine the characteristics of producers, consumers and suppliers of factors of production (especially labor power) simultaneously (which makes their behavior a complex task to analyze).

Thus, changes in market prices will influence the behavior of households as producers, consumers and suppliers of factors of production simultaneously. The net effect of economic crises and reforms on household behavior may be ambiguous. It will depend upon the magnitude and direction of price/substitution and income effects. It will also depend on other factors such as the stage of development the economy is in and the nature of the markets – their imperfection and/or their absence - in which the households participate – especially labor markets and their characteristics.[3] Labor markets are one of the most important channels through which macroeconomic policies are mediated. Contractions in aggregate demand have short-run impacts on households as demand for labor declines. People may become unemployed, work fewer hours, find work in the informal sector and/or

[3] For example, imperfect and/or missing markets will impose additional constraints on household optimization. Market signals may be weak and noisy due to market imperfections and incompleteness attenuating the linkages between macroeconomic changes and households' behavioral responses.

increasingly become self-employed. If incomes are falling due to falling wages and/or higher relative prices of goods, the labor force participation of households may increase - especially those of secondary workers such as spouses and children – to simply maintain household budgets,), Eele, Hay and Hoddinot (1993), Skoufias (1994). These short run effects can have adverse long term impacts – for example due to a permanent reduction in the human capital accumulation of children who may have joined the labor market as a rational response to short term adversities but remain permanent workers even when economic recovery gets underway. Furthermore, to assess the impact of economic reforms on the incidence and characteristics of child labor in particular, we will need to enter the realm of intra-household allocation processes given the complex interdependence of time use of adults and children in a household.

On a more general note, the effect of growth in reducing poverty and increasing household and individual well-being is more complicated than the simple 'trickle-down' story. It is now recognized that these effects are determined by the complex interplay between the nature and composition of growth, household behavior and government policies and expenditures.[4] Economic growth in all developing countries has been accompanied by increasing rates of industrialization and urbanization. Not only the formal sector but the informal sector has been growing and at a more rapid pace than the former. Most children (and other members of poor and many non-poor households) find wage work in the urban and rural informal sectors in a range of activities. Rapid growth of the informal sector presents increasing income generating activities for children. It is relatively easier to enter the informal sector and does not necessarily require fixed costs such as those for entering the formal sector, Hill (1983).

Given that agriculture continues to be the main occupation of the majority of people in all developing countries, and that the poor are found in greater concentration in rural areas and in agricultural activities, economic reforms that improve the terms of trade in favor of agriculture may result in a greater incidence of child labor with the increase in available economic opportunities.[5] This can be considered a short term behavioral response to changes

[4] Of particular importance for poverty alleviation and increased household welfare is how growth affects households in the lowest income categories. Most growth episodes in developing countries have tended to leave the bottom twenty percent of the population in terms of income distribution untouched.

[5] The impact will be greater, the lower are the expected returns from a low quality, irrelevant education system.

in relative prices (substitution effect). If, on the other hand, as a result of reforms, the labor market becomes more responsive to human capital attainment, this will increase incentives for households to invest in the education of their children and reduce (at least some) child labor. This is a longer term response being an investment decision (income effect). The net result of economic reforms on the incidence of child labor can thus vary depending on the length of time being considered and intensity of each effect on the specific context.

Child labor itself comprises a whole range of activities, with usually specialization along gender and age lines. The distribution of child labor by gender and age and type of activity is also likely to change as a result of reforms – it may make one category of child laborers better off (usually boys) and another worse off (usually girls). After this brief discussion of the links between economic growth, economic reforms and child labor we now go on to present some important issues related to the analysis of child labor from the previous literature.

3. Issues in Child Labor and Household Decision-Making

In order to "set the stage" for the empirical analysis, it would seem fruitful to briefly review some important issues that arise in the analysis of child labor[6]. This will both serve as a general theoretical background of the empirical analysis as well as highlight issues that needs to be incorporated in the latter.

Households are settings for important productive activities, many of which are done by children, Skoufias (1994). Child labor seems to play many roles in a household's economy: provide labor input in the family farm or enterprise, work in the market for wages; do household chores to complement adults' efforts or substitute for them to release them for wage work; as consumption and/or income smoothing device. From a purely economic point of view, a complex of demand side and supply side and short term and long term issues seem to be at work in child labor outcomes. In this section, we will locate the child labor decision in the context of household decision-making as well as the other factors that impinge upon it and mediate it. We will also evaluate current theoretical-analytical and empirical-descriptive literature that tries to understand the child labor issue but with an eye for insights this

[6] For an excellent survey of economic theories of household behavior, see Bergstrom (1996) and Strauss and Thomas (1995).

literature might provide to our two assertions above – that child labor is a multi-dimensional and a dynamic issue.

Child Labor and Poverty:

Among the causes of child labor, poverty is often cited as the most important one, and in the same vein, economic growth considered a necessary condition for its reduction. It may be conjectured that most child laborers belong to poor households who need their children's income to supplement their household budget and who would experience a substantial loss in welfare if children were sent to school, not only because of direct costs of schooling, but also due to losses from foregone income, Bonnet (1993).

Theories of the child labor-poverty interaction include those that base their explanation of its existence on the low incomes of households with or without credit constraints. A recent paper by Basu and Van (1998), for example, makes the assumption that the non-work of children is a 'luxury good' for households. Households offer the labor of their children if income is below a certain threshold level and not if it is above it. The extent of child labor is determined by demand conditions and equilibrium in the labor market. They show the possibility of multiple equilibria: a) high equilibrium wages and no child labor and b) low equilibrium wages and positive child labor. Ranjan (2000) shows how child labor can arise due to a combination of poverty and credit constraints. Altruistic rational parents care for the quality of their children and want to invest in their education as long as the returns from education are high enough. However, faced with credit constraints (due to their poverty) they settle for the second best choice of sending their children to work.

If the primary determinant of child labor is low household income, then any measure to deal with it will have to be household income-based. However, whether poverty is the most important reason for child labor is still a matter of considerable debate. Another variation on the postulated relationship between income levels and child labor is the inverted U for many countries in West and Sub-Saharan Africa, Andvig, (1999). The evidence from existing empirical studies is inconclusive on this question, Canagarajah and Nielsen (1999), Chandrasekhar (1997). Nevertheless, the assertion that child labor and poverty are correlated phenomena is indisputable. There is also little disputing that economic growth is necessary both for poverty reduction and for generating the required resources for implementing government policies that target child labor eradication. The point being emphasized here is

that economic growth per se may not be sufficient to reduce the incidence of child labor, Swaminathan (1998). Additionally, economic growth may not even be necessary for reducing child labor, see Weiner (1991).

***Child Labor and Credit Constraints*:**

Related to – although not identical to – the poverty explanation of child labor discussed above is the possible existence of credit constraints. Education is a commodity like many others. It is an investment good – current resources have to be foregone for future returns. Education may be privately or publicly provided. In developing countries, public provision of education which is free or subsidized is the norm.[7] There are private costs and benefits and social costs and benefits from educational attainment (or lack of it) for members of a society. Research indicates that both social and private returns to investing in education are extremely high, and the returns are the highest for public expenditure on education compared to other categories of public expenditure, Psacharapoulous (1994).

Given high private returns, the question arises as to why parents do not – more or less automatically - send their children to school? It is argued that lack of access to credit is an important factor that can prevent households from investing optimally in the education of their children, Ranjan (2000). Credit and insurance markets are beset by pervasive market failures everywhere in the developing world. These market failures are especially severe for low-income households who are unable to provide the requisite collateral to procure loans. Not only in developing countries but also in developed countries, it is difficult to secure loans for human capital investment purposes. When parents are unable to send their children to school, they may put them to work as a second best alternative for the use of a child's time.

Imperfect or absence of credit and insurance markets in general have been shown to result in the misallocation of resources at the household level, Rosenzweig and Wolpin (1993). Apart from underinvestment in children's schooling, imperfect credit and insurance markets can have other adverse impacts on the incidence of child labor. Child labor is one of the devices households use to manage risk if other forms of insurance are not available. Short

[7] In most developing countries, the private schooling sector accounts on average for 10 percent or less of student enrollment.

term child labor may be used to smooth consumption in bad times.[8] The literature analyzing intra-household allocation has found that the latter depends on endowments and preferences of individual members of the household.

Similarly, some studies find that risks are not shared perfectly within households and impacts on different household members differently, Doss (1996), Dercon and Krishnan (1997). Sawada (1997) finds that in rural Pakistan, negative shocks experienced by households, are smoothed through the use of child labor, but more for girls than for boys. These short term measures used by households have long term impacts, particularly through their adverse influence on the effective schooling attainment of children, Hanan and Skoufias (1997). Some children may drop out of the schooling system completely and become full time child laborers. There are few empirical studies that test the effects of access to credit on the household's schooling-work decision. In general, there is no consensus whether the effect is positive or negative – it can go either way under different circumstances, especially depending on labor market factors and the degree of substitutability between hired labor and family labor (Wydick, 1999).

Alternatively, we can think of short term child labor as an ex-post behavioral response and long term child labor as an ex-ante household strategy. This distinction in terms of the time horizon may be useful for judging the welfare properties of child labor and for policy purposes. It also adds to the list of reasons as to why it is important to realize that there are different kinds of child labor with different causes and consequences. [9]

Child Labor and Schooling – Quality and Subsidies:

Another important dimension of child labor is the fact that given the central importance of education and schooling in modern societies, it is difficult to discuss child labor in isolation from schooling. Childhood is the time deemed for the acquisition of education. Work competes (at least to some extent) for a child's time with the alternatives of

[8] Long term child labor, on the other hand, may be due to the absolute poverty of the household, a portfolio diversification strategy or a response to the relative returns to a child's time.

[9] Note that this discussion is based on the underlying assumption that the household tries to minimize consumption and/or income fluctuations in the same manner as an individual does. The unitary model of household decision making has proved very powerful in terms of analyzing household behavior as will be discussed later. However, it has often been rejected in empirical work as the true model of the household. Cooperative and non-cooperative models of household decision-making seem to be able to capture more of the ways in which resources and risks are allocated and/or shared within households (Doss, 1996).

schooling and leisure. In the neo-classical framework of the economics of the household (Becker, 1965) rational optimizing households allocate their children's time (as well as adults' time) where they perceive the marginal returns to be the highest depending upon available economic opportunities and endowments.

Moreover, as has been discussed above, education is an investment good where current costs have to be borne for expected (but uncertain) returns in the future. Many studies document and estimate both the private and social returns to education. It has generally been found that both kinds of returns to education are very high in developing countries, and of all levels of education, returns to primary education are the highest, Psacharopoulos (1994). Given such high returns why, then, is the demand for education and/or participation in education low in developing countries? If the poor lack sufficient funds to bear the opportunity cost of education of their children on the part of poor households and have little or no access to credit, then even if returns to education are high, they may be constrained to choose work over the schooling of their children.

We also have to look towards the available economic opportunities and the quantity and quality of educational services that the poor have access to. As is generally the case, if opportunities for the poor are mostly found in the informal sector - in kinds of activities that require little or no formal schooling - and if schooling services are either not available or are of poor quality, the returns from education may be so low that parents will rationally want to send their children to work where relative returns may be higher.

When household resources are scarce, there may be intra-household competition for resources among siblings which will be influenced by the demographic structure of households. For example, in many countries a child with more older siblings, especially elder sisters has a greater chance of going to school and lower probability of working. The presence of older siblings relieves the child from work responsibilities, especially in the unpaid household sector. Again, as has been discussed before, household risk attitudes may also play an important part in selective discrimination in the intra-household allocation of educational resources. Some poor households may send some children to work and others to school as part of household portfolio diversification.

The labor force participation of children in developing countries is not incompatible with schooling (though it may affect the quantity and quality of learning). Many child

laborers also attend school and the category of children who combine work and schooling is in many cases a very important one. Not only because often for children who combine work with schooling, work is necessary for the children to pay for their own and/or siblings' education. To what extent children are able to combine work with schooling - without undue adverse effects on human capital accumulation - will depend upon the types of activities they are engaged in. The combination of work and schooling is now being advocated by scholars and activists as an intermediate step in the policy program of reducing and ultimately eliminating child labor, Grootaert (1998). Educational expansion, by itself, has been considered an antidote to child labor, especially by policymakers. However, it has not been as effective in meeting this goal although increasing greater child participation in schooling activities is an important goal in its own right. Ravallion and Wodon (1999) show in the case of Bangladesh that school subsidies lead to increased school enrollments and schooling duration. However, there is only a small and less than proportionate reduction in child labor. The implication of this observation is that increased time devoted to schooling may come out of leisure instead of labor. It may also lead to increased labor participation of other children in the household to make up for lost labor time. Much more analysis needs to be done to understand the trade-offs as perceived by the households themselves in making the schooling-work decisions on behalf of their children.

Child Labor and Social and Cultural Norms:

Economic incentives (or disincentives, as case may be) apart, attitudes towards work and schooling vary from context to context and influence the relative valuation of different uses of a child's time which varies by gender and age. There are socially prescribed roles for boys and girls of different ages - children working long hours in the household or the farm may be considered by the household, the children themselves and the community as normal and part of 'growing up'[10], see Andvig, Canagarajah and Kielland (2001) for a discussion in an African context.

[10] There are interesting exceptions – which may vary by income and wealth levels of households. For example, very poor households may not be able to afford to follow social norms. In societies where women working outside the household are disapproved of, women from the poorest households may do wage work to maintain family subsistence. As incomes increase, there will be a move towards the conservative social norms where women are secluded within the threshold of the household.

Baland and Robinson (2000) demonstrate that even when parents are altruistic, child labor can arise because children cannot write credible and enforceable contracts with their parents to transfer resources to them in the future. Parents are unable to capture the full returns from their investment in children's education and therefore underinvest in education, relative to what is socially optimal. As labor and schooling exhaust a child's time endowment, less schooling means more labor.

Child Labor and Demand Side Issues:

When discussing child labor, it should be noted that only a small percentage of all child laborers work for wages in the market - most children are unpaid domestic workers. Nevertheless, we can conceptualize a 'child labor market' in either case; for the unpaid domestic sector, we can consider households as employers of their own children.[11] The demand side of the market when children are employed for wages has not been as actively or deeply researched as has been the supply-side (household) factors that explain the existence of child labor. Children in wage work are found mostly in the informal sector in manufacturing and services, in petty trading and other self-employment activities (and as domestics in households) in the urban areas. In rural areas, children may work as hired laborers for wages or in-kind compensation. However, in the rural areas of most developing countries, children work as unpaid workers on family farms or in household chores.

Assumptions about the labor market in general and the child labor market in particular are of crucial importance for both a better understanding of the phenomenon and the ensuing policy-implications. For example, the existence of well behaved (child) labor markets may be a more appropriate assumption in some contexts than in others. Also, in some cases, the child labor market may be monopsonistic or otherwise segmented for demand-driven reasons, Chandrasekhar (1997), Grootaert and Kanbur (1995). The structure of the demand for labor in general and for child labor in particular will also depend on the nature of the technology being used in the industry/market in question.

In some industries such as carpet weaving, bangle-making, matches and mining, it is deemed that children are employed in large numbers because of their greater suitability for the tasks at hand, the so called 'nimble fingers' argument. The argument is that children have

[11] Practically, the latter is hard to operationalize because children contribute to domestic chores as part of their 'socialization' and effort in this sphere will be considered as child labor if it crosses some critical limit.

irreplaceable skills and cannot be substituted by adult labor as far as these industries are concerned.[12] On the other hand, it has been shown for some industries where a heavy concentration of child labor is found that employing children is only marginally profitable for firms, Burra (1994). They can easily switch to adult labor and pass on the increased cost to customers without hurting profits. Why, then, is there a demand for child labor in these industries? Firms employ children not only for their better suitability for certain tasks but also for their lower reservation wages, and for non-pecuniary reasons such as their lack of organized bargaining power. Firms incur certain fixed costs in hiring and training a given set of workers apart from the variable costs paid out as wages, Oi (1996). By hiring child laborers, firms economize on these fixed costs.[13] However, it may also be the case that by employing child laborers, employers increase their bargaining power over adult laborers. So, again, whether child labor is a substitute or a complement to adult labor is open for debate.

Plausibly, children and adults are substitutes in some types of activities and not in others. Nevertheless, the child labor market cannot be discussed in isolation from the adult labor market. In fact, the nature of the interrelationship is important for analyzing the impact of macroeconomic reforms on the nature and incidence of child labor. To the contention that child labor displaces adult labor and/or child labor is associated with high adult unemployment and underemployment must be juxtaposed on the observation that a high child participation rate is found both in high and low adult participation rates scenarios. The combination varies from context to context. Child and adult labor interact in complex ways both from the demand and supply sides. For example, Skoufias (1993) finds that in India, a rise in female wage rates increases a child's laboring time. Levy (1985) finds the opposite in Egypt. In the first case, the substitution effect outweighs the income effect and vice versa in the second case. The difference in outcomes in the two contexts requires deeper analysis of underlying conditions for better understanding the dynamics of incentives, institutions, resources and values at work. The child labor market is embedded in larger social realities which may have significant influence on its nature. In developing economies, very often social institutions interact with market institutions to produce different kinds of labor market segments. For example, gender casting of work, which exist in most societies. A different

[12] These industries are also often important in the country's exports.

[13] In fact, in some industries, in the first few months when children are undergoing 'apprenticeship', they are not even paid, Burra (1994).

example is the caste system in India, which has been a basis for occupational choice and division of labor both within and outside the household. Externally, it may be used as a rationing device in a demand constrained child labor market.[14]

In the case of children working in the unpaid domestic sector, we can think of households as employers of their own children. The demand for labor depends upon the household production function both for household consumption and for sale in the market. If an external market for child labor exists, then the opportunity cost of a child's time will be the market child wage. If not, but if instead the child substitutes for adult members in household chores, then the opportunity cost of a child's time will be the market wages for adults. It is unlikely that perfect markets exist for all household goods demanded and supplied by households so separation of production decisions from preference parameters is implausible. The household maximization problem endogenously determines the shadow prices of household goods and shadow wages of household labor along with household equilibrium in the demand and supply of household commodities and factors of production.[15]

On a cautious note, the analogy of the presence of implicit markets within the household is useful but has to be interpreted with caution. These markets are far from the perfectly competitive markets we find in theory and not even close to the kinds of markets found in the real world. What is exchanged and at what price when children do household work is not at all clear. Work within households have elements of both coercion and cooperation and it is not easy (if not impossible) to disentangle the two.

Child Labor and Household Decision Making:

Anthropological and sociological studies document household structures found in various parts of the world which are significantly different from the common preferences model, with or without production. The common preferences, or unitary, model assumes the existence of an aggregate utility function for the household and members pool income and labor supply. It does not take account of conflicts of interests between individual members of the same household that may have an important bearing on how resources and responsibilities are allocated within the household. Hoddinott and Haddad (1995) show how

[14] This may be true even in the allocation of scarce schooling resources.
[15] This too may be problematic to disentangle as the production technology for household goods is unobservable.

incomes earned by women have a different effect on the allocation of household expenditures compared to incomes earned by men.

Given the shortcomings of the common preferences/unitary model, researchers have used cooperative and non-cooperative bargaining models of households in recent years to analyze the issues of intra-household resource allocation, see, for example, McElroy and Horney (1981), Lundberg and Pollak (1994). In many cases, the income pooling assumption of the common preferences model has been decisively rejected. Furthermore, these analyses show that the identity of members inside households and the dynamics between them matter for the household's economic decisions. Therefore, without adequate regard for the appropriateness of the household model being used in a given context, inappropriate and consequently harmful policy actions may be taken based on an incomplete analysis.

Collective models overcome important shortcomings of the common preferences and unitary models of the household and their econometric counterparts prove that individual preferences and endowments matter in intra-household processes. However, they too leave some questions unanswered. These models generally assume that whatever be the sharing rules within households, outcomes are Pareto-efficient. Work by for example Udry (1994), on the other hand, show that Pareto-efficiency cannot be assumed but needs to be tested. This work finds evidence against Pareto-efficiency in intra-household allocation processes. In order to analyze the welfare economics of child labor, especially in domestic work, a possible approach could be to test for the efficiency properties of allocation of labor and other resources between adults and children of different age and gender. Existing studies, moreover, do not so far include children as potential decision-makers even though as child laborers they supply labor and earn income. Children are assumed to be public goods for the households and only adult decision-makers are analyzed. There is some evidence suggesting children who contribute to household income acquire some influence in household decisions and in the allocation of expenditures/resources.

4. Economic Model and Econometric Methodology

In this section, we formalize the ideas laid out in the previous section by presenting the economic model underlying the econometric analysis. Then follows a discussion of the econometric methodology applied in this paper, i.e., how to move from the theoretical economic model to an econometrically estimable model.

Economic Model:

We will now describe the economic model of the household decision process regarding children's time allocation that underlies the econometric analysis in the next section. First, the objective of the household decision maker[16] needs to be made explicit. It seems reasonable that the objective is to maximize utility of adults and children in the household jointly and, further, that the utility of the household depends on aggregate household consumption[17], as well as the child's schooling and leisure. This gives rise to the following household utility function (for simplicity in the presentation, we assume the household only has one child but the results can readily be extended to the general case)):

$$u_i = u^i(C_i, L_i, S_i, Z_i) \qquad (4.1)$$

where C is the aggregate aggregate consumption, and L and S denotes leisure and schooling of the child, all of which are for household i. It is assumed that u(.) is strictly quasi-concave in C, S and L. Inclusion of the vector of exogenous household and community variables Z allows for heterogeneity across households. For example, the quality of and/or the distance to local schools will influence the parents' expected utility from sending their children to school. Also, it allows for differences in tastes due to ethnicity and/or religion of the household.

The maximization of (4.1) is subject to the following constraint on the child's time:

$$T_i = S_i + L_i + H_i \qquad (4.2)$$

Where T_i, total time available to the child of household i, may be devoted to schooling, S, leisure, L, or wage labor, H. The maximization of (4.1) is also subject to the household budget constraint:

$$C_i = W_i H_i + Y_i(Z_i) \qquad (4.3)$$

[16] Or decision makers: we allow for more than one decision maker – in the extreme case, we could think of a collective decision process. However, since our emphasis is on the empirical (reduced form) results, we will not explicitly model this further.

[17] In this model formulation, we operate with one composite good, C. However, one may think about this as a basket of all possible consumption goods.

where C, W and H denotes consumption, (child) wages, and (child's) hours worked, respectively. Y denotes the income from all other sources than child labor, and is assumed to be a function of Z, also (which will include, for example, the parents' education, occupation and landholdings).

The household decision maker maximizes (4.1) subject to (4.2) and (4.3) with respect to C, S, L and H, given W, Z and T. We may combine the constraints (4.2) and (4.3) into the *composite* constraint:

$$C_i + W_i S_i + W_i H_i = W_i T_i + Y_i(Z_i) \qquad (4.4)$$

This is also denoted the "full income" budget constraint. From (4.4) it follows explicitly that W_i is the price of schooling to parents, since this is the rate at which they could "sell" their children's time at the (child) labor market.

With the composite constraint (4.4), the optimization problem of the household decision maker is to maximize (4.1) with respect to C, L and S subject to (4.4). This leads to the first-order conditions:

$$\frac{u^i_{C_i}(.)}{u^i_{S_i}(.)} = \frac{1}{W_i} \qquad (4.5)$$

$$\frac{u^i_{C_i}(.)}{u^i_{L_i}(.)} = \frac{1}{W_i} \qquad (4.6)$$

which simply state that the household decision maker will equalize the marginal rates of substitution between consumption and schooling and consumption and leisure with the relative prices (where the price of consumption has been normalized to one).

From the first order conditions we may then subsequently obtain the derived demand functions (as perceived by the household decision maker) for the child's schooling and leisure:

$$S_i = S^i(W_i, W_iT_i + Y_i(Z_i), Z_i) \quad (4.7)$$

$$H_i = H^i(W_i, W_iT_i + Y_i(Z_i), Z_i) \quad (4.8)$$

Where S_i and H_i are the decision variables (schooling or work of child in household i), and the other variables are as before.

Econometric Methodology:

In moving to an estimable model, essentially we are after an empirical counterpart of the economic model as given by equations (4.7) and (4.8) above (noting that child labor supply is merely the "dual" of the demand for leisure function, (4.8)). There are several possibilities here. Previously, the literature that has regarded schooling and child labor a joint decision has applied either (1) a bivariate probit, thus simultaneously estimating a probit for the schooling decision and one for the work decision in a seemingly unrelated regression structure; see, e.g., Canagarajah and Coulombe (1997) and Nielsen (1998)), or (2) a multinomial logit for the four possible outcomes (school, no work), (school, work), (no school, work), (no school, no work); see, e.g., Grootaert (1998). Both models may be justified in terms of our objectives, since both models are applicable in cases, where there are multiple outcomes (although the bivariate probit requires exactly four outcomes to be applicable, which, however we have here, namely the four different activities of children), which do not lend themselves to a natural ranking, Greene (2000). However, we apply a multinomial logit model due to the marginal probabilities being computationally easier to obtain, see Greene (2000) for details. Our dependent variable is the categorical indicator variable:

$$y_i = \begin{cases} 1 \text{ if child i neither attends school nor works} \\ 2 \text{ if child i only attends school} \\ 3 \text{ if child i both attends school and works} \\ 4 \text{ if child i only works} \end{cases}$$

The log-likelihood for the multinomial logit model is:

$$\ln L = \sum_{i=1}^{n} \sum_{j=0}^{J} d_{ij} \ln \text{Prob}(Y_i = j) \qquad (4.9)$$

where

$$\text{Prob}(Y = j) = \frac{e^{\beta_j' x_i}}{1 + \sum_{k=1}^{J} e^{\beta_k' x_i}} \qquad (4.10)$$

where Y is the dependent variable (activity of the child), subscript j denotes the possible outcomes of the dependent variable (school, work, both or neither) and subscript i denotes the individual. x_i is the vector of explanatory variables for individual i, while β is the vector of parameters.

An important issue in analyzing the link between poverty and child labor by means of estimating the economic model, as given by the equations (4.7) and (4.8) above which needs to be addressed, is the problem of potential endogeneity/simultaneity. This problem arises whenever one or more of the explanatory (i.e., "right-hand-side") variables are not exogenous to the dependent (i.e., "left-hand-side") variable. In the present case, household expenditure may not be exogenous to the activity of the child, in the sense that, for example, a relatively high household expenditure per capita, which would seem to imply that the household is wealthy, could be expected to induce the household not to send their children to work. However, it could also be that households are able to sustain a relatively high household expenditure per capita *because* they send their children to work. Whenever this problem is present, it may lead to biased estimates also on the estimates of the other parameters of the model, i.e. for variables which are themselves exogenous to the dependent variable.

One solution of this is to apply instrument variable estimation techniques. However, it is hard – if not impossible – to come up with an instrument for household expenditure that is not correlated with the child activities (which is required for the instrument to be valid). However, since one of the worst consequences of endogeneity is invalid parameter estimates for the other variables, i.e. other than the potentially endogenous explanatory variable, one

way of checking whether severe endogeneity bias is present is to run the models without the potentially endogenous explanatory variable (here, per capita expenditure).

The results from this exercise reveals that the parameter estimates (and, most importantly, their signs) are fairly robust to omitting (or, similarly, including) this variable, in turn indicating the absence of serious endogeneity bias from the expenditure variable. In addition, one may claim that due to the expenditure variable being defined as expenditures for the past year, while the labor- and schooling variables are defined as activities during the past week, there is such a marginal overlap that the expenditure variable may be said to be endogenous to the labor supply/schooling choice *by construction* – or, at the very least, pre-determined. In any case, combining this argument with the somewhat informal test of the practical consequences or otherwise of the potential endogeneity/simultaneity discussed above, it appears valid to claim that there are no severe endogeneity/ simultaneity problems, *at least for practical purposes*.

5. Descriptive Analysis and Presentation of the Ghanaian Economy[18]

Ghana has undergone wide-ranging economic reforms from the mid 1980s onwards. The core of the reforms have been to gear the economy towards greater market orientation. Transitions are mixed blessings for the poorer households in any country as some of them may experience short-term welfare losses though ultimately benefit in the long run. The naïve view that secular changes in the economy will equally affect all population groups and sub-groups has been discarded, and it has been recognized that structural adjustment programs may benefit some groups and hurt others, at least in the short run, Demery and Addison (1993), Demery and Squire (1995). Hence, it is important to study the impact of reforms, in particular whether and how it affects different groups differently. Such analysis will enable policymakers to design and implement more effective programs in the future.

For our present study we use three rounds of the Ghana Living Standards Survey (GLSS). The Living Standards Surveys are multipurpose household surveys, that are nationally representative, and collect information on a vast array of socioeconomic variables characterizing households and their welfare. The rounds used in this study are the Ghana Living Standards Survey 1987/88 (GLSS1), 1991/92 (GLSS3), and 1998/99 (GLSS4),

[18] The macro economic indicators quoted in this section are from Alderman (1994). See also World Bank (1993, 1995 a,b).

respectively. Economic reforms were undertaken in Ghana, starting with the ERP in 1983. At a crude level, then, the GLSS1 will reflect short term effects of economic reforms and the GLSS3 the medium to longer term effects, while the GLSS4 will reflect long term effects of economic reforms.

Ghana's Macroeconomy and Economic Reforms: By 1983, Ghana's economy had more or less collapsed. Between 1970-80, Ghana's growth rate had fallen by an average of 1.5 percent per annum. Inflation averaged 66 percent, with wide year to year fluctuations. Cocoa production, which dominated both export earnings and government revenues, continued to decline due to distortions induced by trade and exchange rate restrictions that had been practiced for decades. Domestically also, basic institutions had stopped functioning as had most of the public infrastructure.

Moreover, 1983 was also the year of multiple exogenous shocks - the country experienced one of the worst droughts in its history, the sharp decline in world cocoa prices continued, and a million Ghanaians and their families were forced to return from neighboring Nigeria adding to the country's welfare burdens. The wide ranging Economic Reform Program (ERP) was undertaken in 1983 in Ghana with the major aims of restoring economic growth and making the economy more market oriented. Ghana initiated its economic reforms with stabilization and trade liberalization, including fiscal and monetary restraints, phasing out of quantitative restrictions and tariffs on imports and foreign exchange liberalization and removal of domestic price distortions. Agricultural sector reforms were undertaken towards the end of the 1980s with the major aim of reducing and removing the biases and distortions in the rural sector.

Ghana had seen significant and continuing decline in the production of cocoa from the mid 1950s onwards when it produced more than 30 percent of the world's cocoa. The failure of the state Cocoa marketing board in giving a higher share of the market value of cocoa to farmers resulted in smuggling to neighboring Côte d'Ivoire and subsequently lack of incentive to produce leading to a declining share in the world markets. Most of the reform in this sector focused on removing price distortions in order to improve production incentives for farmers. It was expected that as a result of the latter, rural farm and non-farm growth would increase, leading to an overall reduction in poverty. Ghana implemented market determined exchange rates, reductions in import tariffs and export taxes, divestiture of state

enterprises and removal of agricultural input subsidies to enhance incentives for greater production and incomes in the rural sector.

The Impact of Economic Reforms on Child Labor: Economic reforms in Ghana were initiated in 1983, and reform of the agricultural sector was undertaken later towards the end of the 1980s. By many counts, economic reforms in Ghana have been successful. The growth rates of GNP and GNP per capita have been positive every year between 1983-1993. The agriculture, industry and service sectors, which had registered declining growth prior to reforms, grew at positive rates from 1984 onwards.

These macroeconomic developments just described – as well as their possible effects on micro-level economic behavior - are likely to be visible at the micro level, too, as captured by the household surveys applied in this study. Tables B1 and B2 in Appendix B describe the typical characteristics of male and female child laborers in the years 1987/88 and 1991/92 respectively.[19] Tables B3 and B4 in Appendix B describe schooling and labor force participation decisions by gender, age and income quintile of the households of the children in the two survey years, respectively. The age group being considered is children between 7 and 14 years. Although a child may start work from when he or she is 4-5 years old, the Ghana Living Standards Survey uses age 7 as the cutoff for recording work activities.

The mean ages of male and female child laborers in both rural and urban areas in the two years have remained more or less constant around 11 years. The proportion of rural child workers, both male and female, have increased substantially between 1988 and 1992, from 33.4 percent to 49.1 percent for boys and from 25.2 percent to 41.2 percent for girls, respectively. More girls have entered the labor market than boys in the interim time period. The proportion of child workers in the labor force, both male and female, too have increased although the average number of hours spent in the labor market have decreased substantially. When we compare and contrast the schooling activities of male and female children in the two years, we can see from Tables B1 and B3, that school participation has increased for both boys and girls, though less for girls than for boys. Nevertheless, on average, 28 percent

[19] We do not present figures from the 1997 survey due to missing observations on key variables, leading to extremely small samples which, in turn, would lead to unreliable conclusions. In particular, the final effective sample of children between the ages 7-14 is only 443 - as compared to 1732 and 3516 children in the two earlier samples – of which only around 1 percent are in the two categories "only work" and "neither attends school, nor works". In turn, this renders application of a multinomial logit invalid and we will apply a binomial probit model instead (we return to this issue in more detail later, in the econometric analysis section).

of children between 7-14 years of age are out of the school system. From Tables B2 and B4, we find that the percentage of both boys and girls in the work only category have declined in 1991/92 from 1987/88, and that in the categories school only and work and school have increased. While this is generally true for all income categories, the largest increases have come in the two highest - 4^{th} and 5^{th} – quintiles.

The incidence of child labor and child schooling is believed to be strongly positively related to the level of household income – this is the so called 'poverty hypothesis' for child labor discussed above. Simply put, a decline in poverty can be expected to be associated with a decline in child labor and an increase in child schooling. Between 1988 and 1992, poverty in Ghana declined from 37 percent to 31 percent as implied by the measures of depth and severity of poverty. This decline in poverty came entirely from the rural areas and some from urban areas other than the capital city Accra. Accra registered a triple fold increase in poverty – from 8.6 percent to 23 percent. Comparing the composition of child workers between rural and urban areas in the two years from Tables B1 and B4, we find child labor in urban areas being more or less constant, while we see a substantial increase in rural child labor in 1991/92. From the point of view of the poverty hypothesis as it relates to child labor, this is puzzling given that rural poverty declined and urban poverty increased in the years under consideration. Also we must be mindful of the fact that these inferences are being drawn from simple cross-tabulations. Given the joint causation of different household behavioral outcomes, identification of cause and effect is not possible without a regression analysis with multiple controls. We will do this in section 5.

Comparing the results from the household surveys with the macroeconomic indicators[20] reveals that the (macroeconomic) growth period from 1983 onwards was punctuated with decline in 1987 and 1988. Real minimum wages and average real monthly income from agriculture also fell substantially. World cocoa prices fell substantially during the adjustment period in 1986. Agriculture has experienced very slow growth in spite of reform measures being taken. We can expect these circumstances to strengthen incentives for greater use of child labor in the years 1987/88 by households. In contrast, child schooling decisions are more appropriately based on long term/permanent income factors of households, due to the nature of the investment, being a long-term (human capital)

[20] From Alderman (1994).

investment. Between 1987/88 and 1991/92, among all child laborers, those employed in agriculture increased substantially – from 67.5 percent to 96.3 percent for boys and from 67.9 percent to 88.5 percent for girls. It should also be noted that the agricultural sector continues to account for more than 40 percent of Ghana's GDP. The majority of the poor in Ghana, around 70 percent, live in rural areas with agriculture and allied activities as their main occupation. In Ghana, as in much of Sub-Saharan Africa, most agriculture is based on production in small family farms. Generally, households are large, while landholdings are small. In 1988, small landholders constituted 94 percent of the rural population. Agricultural wage labor is a small minority and a seasonal phenomenon. Moreover, child labor in Sub-Saharan Africa is a rural and family-based phenomenon. This is in contrast with the kind of child labor found in Latin America, where most child labor is found in wage work in urban areas.

Generally, these preliminary results lends some support to the hypotheses carved out in the introduction of this paper, child labor and schooling responding primarily in the medium to long run. Less children engage primarily in child labor and more children primarily in schooling in the later sample (medium- to long run) than in the earlier sample (short run). More children are combining the two activities in the later sample than in the earlier. This is true of both genders, all ages and income quintiles. There seems to be a complex of demand and supply side factors at work here. Certainly, the relation between income levels and child labor is neither simple nor straightforward. However, these tentative conclusions needs to be substantiated in a multivariate regression analysis, where we take multiple factors into account.

6. Econometric Analysis of Child Labor and Schooling Determinants and Dynamics

We now move to the econometric analysis. Due to the amount of estimates, we will discuss only the major results – and focus mainly on the activities "school only" and "work only" - and refer to the tables in Appendix C for the details.

The results from the full sample for GLSS1 and 3 in Tables C1 and C2 in Appendix C reveal substantial differences between the two periods. In the earlier sample, older children tend to be less likely to go to school and more likely to work, ceteris paribus (the marginal effects are around 11 and 16 percent, respectively). This result is in line with a perception that the marginal product, and hence, the labor-value of the child, rises with age, hence

leading to older children being relatively more likely to work and less likely to attend school. The latter indicates the existence of inter-generational spill-over effects in education, or, similarly, a great deal of persistence in education at the household level.

The next striking result is that children that are biologically related to the household are more likely to attend school, while at the same time less likely to work, pointing to the possible importance of so called "placed children", a phenomenon which is well-known in the next-to-neighboring country of Benin, Kielland (1999).[21] Interestingly, the mother's education does not seem to be affecting the activity of children, while the father's education has a consistently adverse effect on child labor across all levels of education (no education is the reference category), while education of the father promotes the education of the child, as well.

Household composition proves to be an important factor. In particular, the presence of brothers and sisters between 7 and 14 years of age enhances the likelihood of attending school (by around 4 and 6 percent, respectively), in line with previous research, for example Nielsen (1998). Traditions seem important, as revealed by the statistical significance of some of the religious variables. Coming from a Catholic or Muslim background increases the likelihood of attending school (by around 17 and 25 percent, respectively), while Catholics are both less likely to only work and more likely to combine work and school (by around 16 and 5 percent, respectively).

The existing evidence on the effect of the gender of household head is mixed. In the present context, male headed households seem to be more prone to sending their children working and less likely to send children to school (by around 10 and 5 percent, respectively) relative to female headed households. Canagarajah and Nielsen (1999) suggests that it may work both ways, since it may be conjectured that either female heads may care more about the children and therefore use less child labor. On the other hand, it may equally well be the case that female heads may be forced to make use of child-labor more often because they are under economic pressure due to being the sole (adult) breadwinner in the household due to the husband being dead or having left either permanently or temporarily.

[21] The number of children, which have a non-biological relationship to the household head is 444, or a little more than 25 percent of the sample. Hence, since this group is a substantial part of the sample, this issue seems to warrant further analysis.

Our poverty measure, (log of) household expenditures per capita, does not seem to be important except in the work only equation. Furthermore, the impact is small, with an estimated elasticity of about 0.05, implying that a 1 percent income increase increases child labor with 5 percent. This apparently counterintuitive result may be explained by it not necessarily implying causality from poverty to child labor. Indeed, it may be the case that the households are less poor, i.e. can sustain a higher per capita consumption level *because* they engage in child labor.

Being engaged in raising livestock adversely affects the probability of only attending school, while it increases the probability of only engaging in child labor (by around 14 and 12 percent, respectively). This points to the importance of child labor as a rural phenomenon, as does also the fact that the regional variables are significant and positive in the schooling only equation for Accra and urban areas outside Accra, while negative for the rural coastal region. Also, in the work only equation the regional variables for Accra and urban areas outside Accra are statistically significant and negative.

Moving to the later sample from GLSS3 (1991/92), the results from which are shown in Table C2 in Appendix C, the first remarkable thing is that age no longer seems to be important for the activity choice, since now there is an age effect only in the equation for combined work and schooling. However, this may reflect the fact that the older, the children are, the more likely it is that they can engage in both activities, since engaging in physical work *and* at the same time attending school demands a certain maturity of the physique (this variable was borderline significant in the GLSS1 sample). The father's education is, just as was the case for GLSS1, very important for children's activities: the father's educational attainment consistently positively affects the tendency for a child to only attend school, while negatively affecting the tendency of a child to only engage in child labor. However, the mother's education now also comes out significant in the case of middle secondary education. Household composition again proves important. Children with a Catholic, Protestant or other Christian background are more likely to only attend school relative to children with and Animist/Traditional religious background. However, only children with a Catholic (and, marginally, with a Muslim) background are less likely to engage in child labor (by 5 and 4 percent, respectively).

Children from male headed household are, as was also the case for GLSS1, less likely to attend school only and more likely to only engage in child labor. The influence of labor demand variables is now massive, as compared to GLSS1. Both owning land and owning livestock are now statistically significant variables in the household child labor/schooling decision process, both affecting the probability of only attending school negatively, while affecting the probability of only working positively. This contrasts to GLSS1, where only the livestock was important in the household decision process. This points towards the existence of asymmetries in the determinants of child labor over time, something which is consistent with out main hypothesis of there not being a linear relationship between poverty and child labor - indeed, other variables – including the household's demand for labor - are part of and jointly determines the household's child labor/schooling decision. These results indicates the increased importance of labor demand of the household as a determinant for child labor and, thus, points towards the importance of the main conjecture of this paper of child labor being a multi-dimensional concept, components of which include – but are not limited to – the household's labor demand and economic activities as well as poverty/welfare of the household. In particular, the labor demand of the household (or similarly, the economic activities of the household) appear to have become more important in the medium term (as revealed by GLLS3) than they appeared in the short term (as revealed by GLSS1).

As was the case with GLSS1, the importance of child labor of mainly a rural phenomenon is sustained by the results from GLSS3. People from urban areas outside Accra are more likely to only attend school, and less likely to work, and vice versa for children from rural coastal and rural forest areas. Lastly, the importance of household welfare as measured by log expenditure per capita has changed. In the GLSS1 sample, there was only an effect on the "work only" decision, whereas with the GLSS3 sample, the importance of household welfare has shifted to the schooling only decision. The estimated marginal impact is 0.06, implying that a 1 percent increase in household expenditure per capita increase the probability of a child only attending school by 6 percent. Again, this indicates the existence of substantial non-linearities in the relationship between poverty and child labor. In particular, this result suggests that macro economic circumstances – including the massive structural adjustment policies which have taken place between the two samples – is an integral part of this relationship and a major determinant of the underlying process governing

the evolution of child labor supply and child labor demand, even though the impact is modest.

Moving to the GLSS4 sample, the first thing to note is that this part of the analysis has to be done applying a binomial response model rather than the multinomial response model applied previously. It is essentially a data problem, in the sense that there are just too few observations in the "neither work, nor school" and the "only work" categories to validly estimate the model by means of a multinomial logit model. To be specific, as earlier mentioned, there are only five observations in each of these groups, corresponding to around 1 percent of the sample, in effect leaving us with only two groups (i.e., "only school" and "school and work"). Hence, with only two classes, a binomial probit/logit is more appropriate. In addition, the total number of observations is extremely low, owing to a high dropout of the sample on the question of whether the child has been working the past seven days or not (implying that the obtained result, discussed in the following, should be taken with a grain of salt). The results from the binomial probit are shown in Table C3 in Appendix C. Noting that the reference category is children that attends school only, the results overall appear fairly consistent with the previous results in several respects.

To begin with, being a child of the household negatively affects the probability of combining work and school, relatively to only attending school. In accordance with the earlier results, having a sister between the ages 7 and 14 also decreases the likelihood of having to work in addition to attending school, implying some substitutability in child labor within the household. Similarly, the locational variables confirm that child labor is still very much a rural phenomenon, also in this more recent sample. However, now smaller siblings proves important in the sense that they increase the likelihood of combining work and school, relative to only attending school, while children from both religious and non-religious backgrounds are less likely to combine work and school (hence more likely to only attend school) than are children from households with a traditional (animist) religious background. This points to the importance of traditions and customs as an important determinant of child labor.

There seems to be a poverty-child labor link present in this more recent sample, also. In particular, its importance has switched in this later sample, such that it now affects the decision of combination of school and child labor activities relative to only attending school.

The parameter estimate is –0.02, implying that a 1 percentage point increase in per capita expenditure will lead to a decrease in the probability of engaging in child labor (combined with school) of 2 percent, ceteris paribus.

With the caveat of the effective (sub-) samples being quite small in mind, we now turn to the predictions of the models, which are shown in Tables D1 and D2 in Appendix D. First, we note that there has been a dramatic decrease in the predicted probabilities of only working and an increase in the proportion of children that combine school and work both for the full sample as well as across the various sub-samples, controlling simultaneously for the various factors hypothesized too influence this decision while the proportion that only attends school has remained stable and/or decreased, depending on the (sub-) sample and year. These developments support the tentative conclusions based on simple cross-tabulations in the descriptive analysis. Hence, even when taking into account all possible influences simultaneously may we conclude that some support exist for the conjectures made in the introduction of this paper, namely that child labor and schooling is likely not to respond in the short run, while it will respond in the long run – and with opposite sign: child labor will decrease and schooling will increase, once the effects form economic reforms materialize and/or become credible. Further, again, the importance of parents' education on children's activities is very significant. Children, whose mother and/or father have no education are less likely to only attend school and more likely to only engage in child labor activities than is the sample as a whole. This is true for both the GLSS1 and the GLSS3 (we do not make predictions for GLSS4 due to the low number of observations, as earlier mentioned).

Lastly, while there generally is no strong pattern in the impact from poverty as measured by the expenditure quintile of the household, there is a strong positive link between attending school only and poverty of the household, such that the poorer the household, the less likely it is that a child only attends school.

These results are largely consistent with the "real" developments, as discussed in the presentation of the descriptive statistics in section 4, and, thus, indicates that the estimated models capture the features of the data well. So, our main hypotheses are supported in this more rigorous multivariate (regression) framework.

7. Summary and Conclusions

We analyze the determinants of child labor in Ghana, focusing at the dynamics of child labor in the short-, medium and long term, in particular the response to growth and economic policy. Previous studies of child labor and its determinants have mainly been based on a single cross-section. While this may provide a useful "snap-shot" of child labor incidence and determinants at one point in time, we suggest that this approach does not satisfactorily capture the multidimensional character of child labor. In particular, the question of asymmetries in the incidence and determinants of child labor across time seems to have been seriously underdeveloped in the existing literature on child labor, thus leading to imprecise conclusions on factors influencing child labor and, in turn, offering policy choices, sometimes leading in the wrong direction as far as the eradication of child labor is concerned. To fill this void, we analyze and compare the incidence, determinants and dynamics of child labor in Ghana after a brief review of the inter-linkages between economic growth, economic policy and child labor and the literature on child labor and household decision theory as it relates to this paper.

Starting from a premise that the simple – direct - relationship between poverty and child labor, which has often been seen as *the* feature of child labor does not adequately capture the multi facetted nature of child labor, we find evidence of asymmetries in the child labor-poverty link, as well as quite complex dynamics in the evolution of child labor and its determinants over time.

In particular, we find evidence of the poverty-child labor link – while clearly evident in the data – changes over time in the case of Ghana, in the short run affecting only the work decision, while in the longer run affecting the schooling decision, only. For the most recent sample, GLSS4, the importance of the child-labor poverty link has switched, such that it now adversely affects the decision of combination of school and child labor activities relative to only attending school, indicating long-run responsiveness of child labor to policy interventions. Due to the low number of usable observations in the GLSS4, however, the importance of the latter result should not be over-emphasized.

While the results of the dynamic responses of child labor and schooling from policy interventions, thus, are not clear-cut, they do suggest that the view of a simple, linear relation is not valid (or at least, only as a static phenomenon) and, in particular, do not adequately

capture the dynamic evolution of child labor, as it responds to changes in the economic and political climate of the economy.

In addition to these very dynamic findings related to poverty, most of our other main results are quite robust over time. In particular, we confirm evidence from earlier studies of a positive link between parents' education and the likelihood of a child attending school only, and similarly a negative link between parents' education and the likelihood of a child only working. Household composition also proves important, in the sense of the results revealing substitutability between the siblings within the household.

A main result is the existence of structural differences related to rural areas in Ghana, both coming through the increased (child) labor demand from households engaged in agriculture and livestock raising, as well as regional differences among Accra, other urban areas and rural Coastal and rural Forestal regions, the latter two generally exhibiting higher demand for child labor than the former. Similarly, the likelihood of only attending school is generally found to be larger for urban areas than for rural areas.

Traditions and customs, as captured by the religious background of the child proves important as a determinant of child labor and schooling, since children with a Christian, Muslim or other religious background are generally more likely to only attend school, while less likely to only engage in child labor, relative to children from a traditional/animist religious background. This results points towards the importance of other than purely economic factors being crucial to increase our understanding of child labor, its determinants and its prevalence.

A key result is that of the incidence of child labor – both actual and as predicted by our models, introducing multiple influences of child labor and schooling – falling dramatically over time. Additionally, schooling increases over time. These two results - being largely consistent with the "real" developments, as discussed in the presentation of the descriptive statistics in section 4 - thus indicates that the estimated models capture the features of the data well. Hence, even when taking into account all possible influences simultaneously may we conclude that some support exist for the key conjectures of this paper, namely that child labor and schooling is likely not to respond in the short run, while it will respond in the long run – and with opposite signs: child labor will decrease and schooling will increase, once the effects from economic reforms materialize and/or become credible. In the short run, child

labor policies may be ineffective, possibly even counterproductive, since it takes some time for the policy to have its full effect. A very clear example of this is the result that poverty has no affect on the schooling decision in the short run, while it positively affects the probability of only attending school in the long run. We may interpret this result as a certain degree of "sluggishness" being inherent in the household decision process, since the household decision maker first has to believe that the proposed policy interventions will truly be made before she feels certain enough to act on them. Due to the high costs of schooling, both direct and in the form of forgone earnings of the child, human capital investments seem particularly sensitive to policy announcements and to their credibility.

While this study attempted to shed some light on the dynamics of child labor and its determinants, it is a very modest first attempt to do so. Much more remains to be done. In particular, we suggest that more attention be directed to the poverty-child labor link, as the present study raises serious doubts about the validity of this link as merely a simple, linear relationship. Also, it would be interesting to analyze whether similar results hold for other countries who have experienced marked economic reforms.

Further, other factors than the traditional economic factors needs to be analyzed more in order to increase our understanding about child labor and its determinants. These include, but are by no means limited to, intergenerational spill-over effects in education as well as traditions and customs as revealed by, for example, children's religious background. These are all factors, the inclusion of which is crucial to increase our understanding of child labor as a dynamic phenomenon, an understanding which is absolutely crucial to the design and implementation of sound policy in this area in the future.

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Appendix A: Definition of Variables

Age	Age of individual
Age squared	Age of individual squared
Female	1 if female, 0 if male
Child of household	1 if child of household, 0 otherwise
Mother lives in household	1 if mother lives in household, 0 otherwise
Father lives in household	1 if father lives in household, 0 otherwise
Mother: None	1 if mother completed no education (reference group)
Mother: Primary	1 if mother completed primary education
Mother: Middle secondary	1 if mother completed middle secondary education, 0 otherwise
Mother: Post middle secondary	1 if mother completed some post middle secondary education, 0 otherwise
Father: None	1 if father completed no education (reference group)
Father: Primary	1 if father completed primary education
Father: Middle secondary	1 if father completed middle secondary education, 0 otherwise
Father: Post middle secondary	1 if father completed some post middle secondary education, 0 otherwise
Children 0-6 years	Number of children 0-6 years of age
Brothers 7-14 years	Number of brothers 7-14 years of age
Sister 7-14 years	Number of sisters 7-14 years of age
Males 15-59 years	Number of males 15-59 years of age
Females 15-59 years	Number of females 15-59 years of age
Older than 60	Number of individuals older than 60 years of age
Animist	1 if Animist/Traditional religion, 0 otherwise (reference group)
Muslim	1 if Muslim, 0 otherwise
Catholic	1 if Catholic, 0 otherwise
Protestant	1 if Protestant, 0 otherwise
Other Christian	1 if other Christian, 0 otherwise
(Log) per capita expenditure	(Log) per capita expenditure
Male head of household	1 if male headed household, 0 otherwise
Age of head of household	Age of head of household
Age of head of household squared	Age of head of household squared
Household owns livestock	1 if household owns livestock, 0 otherwise
Household owns land	1 if household owns land, 0 otherwise
Schooling expenditure	Total schooling expenditure
Distance (in minutes)	Distance to school (in minutes)
Rural Savannah	1 if individual is from Rural Savannah, 0 otherwise (reference group)
Accra	1 if individual is from Accra, 0 otherwise
Urban areas outside Accra	1 if individual is from urban areas outside Accra, 0 otherwise
Rural Coastal	1 if individual is from Rural Coastal Region, 0 otherwise
Rural Forest	1 if individual is from Rural Forestal Region, 0 otherwise

Appendix B: Descriptive Statistics

Table B1. Typical Profile of a Child Worker in Ghana 1987/88

Variable	Male	Female
Average Age:		
Urban	11.5	11.2
Rural	10.9	10.9
Child Worker Composition:		
Urban	5.0	4.5
Rural	33.4	25.2
Proportion of child workers in labor force	11.6	9.0
Child Labor Force Participation Rate	17.6	13.6
Participation in Farming (percent)	67.5	67.9
Current School Participation (percent)	55.3	47.5
Contribution to total hours of participation nationally	11.0	10.7

Source: Calculations based on Ghana Living Standards Survey 1987/88

Table B2. Joint Labor Force and School Participation Rate (last 7 days) in Ghana 1987/88, by gender, age and expenditure quintiles

	Work Only	School Only	Work & School	None
Gender				
Male	19.6	40.9	14.4	25.1
Female	18.6	38.1	9.4	33.9
Age				
7	9.0	44.3	5.9	40.6
8	15.6	44.0	5.7	34.7
9	15.7	41.9	11.0	31.8
10	19.8	37.8	14.4	28.0
11	19.9	42.0	14.1	23.9
12	24.7	32.6	14.3	28.4
13	25.1	37.3	17.2	20.4
14	25.8	36.1	16.4	21.8
Expenditure Quintile				
1	19.9	36.3	11.6	32.2
2	20.2	38.1	13.7	28.0
3	21.2	39.8	10.4	28.6
4	17.2	40.4	12.7	29.7
5	16.0	45.1	11.3	27.7

Source: Calculations based on Ghana Living Standards Survey 1987/88

Table B3. Typical Profile of a Child Worker in Ghana 1991/92

Category	Male	Female
Average Age:		
Urban	11.8	11.3
Rural	11.0	11.0
Child Worker Composition:		
Urban	4.5	5.2
Rural	49.1	41.2
Proportion of child workers in labor force	14.0	10.0
Child Labor Force Participation Rate	29.3	26.7
Participation in Farming (percent)	96.3	88.5
Current School Participation	76.7	68.3
Contribution to total hours of participation nationally	5.4	5.3

Source: Calculations based on Ghana Living Standards Survey 1991/92

Table B4. Joint Labor Force and School Participation Rate (last 7 days) in Ghana 1991/92, by gender, age and expenditure quintiles

	Work Only	School Only	Work & School	None
Gender				
Male	9.2	56.6	20.1	14.1
Female	9.4	51.0	17.3	22.3
Age				
7	4.7	56.2	7.4	31.7
8	6.7	59.1	11.4	22.8
9	6.1	57.5	17.0	19.4
10	8.8	55.2	20.2	15.9
11	8.2	56.3	23.6	11.9
12	11.5	51.3	22.6	14.6
13	14.0	46.1	28.3	11.6
14	16.4	47.1	24.3	12.2
Expenditure Quintile				
1	13.1	46.4	15.5	24.9
2	6.8	54.1	21.7	17.3
3	10.5	53.8	18.6	17.1
4	8.7	55.2	19.2	17.0
5	5.7	64.6	19.1	10.6

Source: Calculations based on Ghana Living Standards Survey 1991/92

Appendix C: Determinants of Child Labor and Schooling

Table C1. Determinants of Children's' Activities in Ghana, GLSS1

	School only		School and Work		Work only	
	Coeff.	Std.error	Coeff.	Std.error	Coeff.	Std.error
Individual characteristics:						
Age	-0.113	0.060	*0.057*	*0.036*	**0.162**	**0.048**
Age squared	0.004	0.003	-0.002	0.002	**-0.006**	**0.002**
Female	-0.035	0.026	**-0.043**	**0.015**	-0.016	0.020
Child of household	**0.126**	**0.055**	0.014	0.029	-0.074	0.042
Parent characteristics:						
Mother lives in household	-0.046	0.037	**-0.042**	**0.020**	-0.007	0.028
Father lives in household	-0.034	0.046	-0.014	0.026	0.047	0.037
Mother: Primary	-0.041	0.050	-0.019	0.028	-0.015	0.046
Mother: Middle secondary	0.033	0.043	-0.042	0.027	-0.016	0.037
Mother: Post middle secondary	0.114	0.125	-0.120	0.112	**0.212**	**0.097**
Father: Primary	**0.277**	**0.051**	-0.022	0.037	-0.087	0.047
Father: Middle secondary	**0.147**	**0.034**	0.039	0.020	**-0.091**	**0.028**
Father: Post middle secondary	**0.127**	**0.055**	0.049	0.029	**-0.125**	**0.047**
Household Characteristics:						
Children 0-6 years	-0.005	0.009	0.006	0.005	0.011	0.008
Brothers 7-14 years	**0.043**	**0.017**	-0.002	0.009	-0.008	0.013
Sister 7-14 years	**0.058**	**0.020**	0.010	0.011	-0.011	0.017
Males 15-59 years	0.004	0.012	**-0.022**	**0.007**	-0.009	0.011
Females 15-59 years	0.012	0.013	**0.018**	**0.007**	-0.003	0.010
Older than 60	-0.022	0.030	**-0.036**	**0.016**	-0.023	0.022
Muslim	**0.169**	**0.050**	-0.014	0.039	-0.001	0.047
Catholic	**0.254**	**0.054**	0.048	0.027	**-0.158**	**0.056**
Protestant	-0.048	0.054	**0.111**	**0.024**	-0.022	0.045
Other Christian	-0.016	0.059	**0.056**	**0.029**	*-0.090*	*0.056*
(Log) per capita expenditure	-0.014	0.026	0.001	0.016	**0.048**	**0.020**
Male head of household	**-0.096**	**0.032**	**0.046**	**0.019**	0.047	0.027
Age of head of household	**-0.012**	**0.005**	-0.003	0.003	0.003	0.004
Age of head of household squared	**0.000**	**5.71E-05**	5.09E-05	0.000	-2.9E-05	4.64E-05
Household owns livestock	*-0.140*	*0.089*	-0.045	0.053	**0.118**	**0.049**
Household owns land	-0.024	0.039	-0.017	0.021	-0.003	0.032
Cost of Schooling:						
Schooling expenditure	-3.69E-07	7.61E-06	**9.39E-06**	**4.04E-06**	-7.45E-06	6.23E-06
Distance (in minutes)	-5.1E-05	0.001	**0.001**	**0.001**	-0.001	0.001
Location:						
Accra	**4.628**	**0.222**	**-2.679**	**0.204**	**-5.456**	**0.238**
Urban areas outside Accra	**0.088**	**0.042**	-0.016	0.029	**-0.195**	**0.038**
Rural Coastal	**-0.090**	**0.044**	-0.005	0.028	0.045	0.032
Rural Forest	0.005	0.035	0.004	0.020	-0.034	0.026
Constant	**1.205**	**0.431**	-0.495	0.257	**-1.476**	**0.347**

Notes: The coefficients are marginal probabilities. Number of observations = 1732; Wald $\chi^2(102)$ = 7679.67; Prob > χ^2 = 0.000; Log likelihood = -2073.911; Pseudo-R^2 = 0.107. **Bold:** Statistically significant at 5 percent; underline: Statistically significant at 10 percent; *cursive*: Statistically significant at 15 percent; standard errors are robust Huber-White Sandwich standard errors, White (1980).

Table C2. Determinants of Children's' Activities in Ghana, GLSS3

	School only		School and Work		Work only	
	Coeff.	**Std.error**	**Coeff.**	**Std.error**	**Coeff.**	**Std.error**
Individual characteristics:						
Age	-0.052	0.041	**0.165**	**0.030**	0.050	0.034
Age squared	0.002	0.002	**-0.007**	**0.001**	-0.001	0.002
Female	**-0.038**	**0.018**	-0.012	0.012	-0.020	0.014
Child of household	-0.029	0.042	0.013	0.026	**0.092**	**0.034**
Parent characteristics:						
Mother lives in household	**-0.091**	**0.029**	-0.020	0.019	**0.050**	**0.025**
Father lives in household	**0.145**	**0.037**	**-0.045**	**0.023**	**-0.174**	**0.028**
Mother: Primary	*0.050*	*0.032*	-0.001	0.021	0.021	0.028
Mother: Middle secondary	**0.064**	**0.030**	0.027	0.020	2.19E-05	0.028
Mother: Post middle secondary	-0.019	0.093	-0.075	0.072	-0.126	0.104
Father: Primary	**0.090**	**0.036**	0.032	0.023	-0.059	0.031
Father: Middle secondary	**0.066**	**0.025**	0.018	0.016	**-0.048**	**0.020**
Father: Post middle secondary	**0.147**	**0.038**	-0.031	0.028	**-0.133**	**0.040**
Household Characteristics:						
Children 0-6 years	-0.009	0.008	-0.001	0.005	0.002	0.006
Brothers 7-14 years	0.023	0.014	0.004	0.008	0.002	0.010
Sister 7-14 years	0.025	0.016	-6.6E-05	0.010	-0.019	0.012
Males 15-59 years	**-0.020**	**0.009**	**0.024**	**0.005**	0.003	0.007
Females 15-59 years	0.010	0.010	-0.008	0.007	-0.001	0.007
Older than 60	0.010	0.020	0.004	0.014	-0.014	0.016
Muslim	0.039	0.027	**0.055**	**0.019**	-0.040	0.021
Catholic	**0.120**	**0.031**	0.021	0.022	**-0.050**	**0.025**
Protestant	**0.140**	**0.031**	**0.052**	**0.019**	-0.035	0.024
Other Christian	**0.111**	**0.030**	0.009	0.019	-0.031	0.023
(Log) per capita expenditure	**0.060**	**0.018**	-0.001	0.012	-0.014	0.014
Male head of household	**-0.105**	**0.026**	0.006	0.018	**0.136**	**0.022**
Age of head of household	-0.000	0.004	0.002	0.003	-0.005	0.003
Age of head of household squared	-1.7E-05	0.000	-1.2E-05	2.74E-05	**6.07E-05**	**2.85E-05**
Household owns livestock	**-0.084**	**0.043**	*-0.064*	*0.039*	**0.065**	**0.028**
Household owns land	**-0.054**	**0.019**	0.003	0.013	**0.035**	**0.016**
Cost of Schooling:						
Schooling expenditure	**1.07E-05**	**2.74E-06**	**8.75E-06**	**1.76E-06**	2.08E-06	2.20E-06
Distance (in minutes)	-0.000	0.000	**-0.001**	**0.000**	**0.000**	**0.000**
Location:						
Accra	-5.032	.	-2.141	.	-2.835	.
Urban areas outside Accra	**0.153**	**0.036**	**-0.146**	**0.033**	*-0.055*	*0.036*
Rural Coastal	**-0.088**	**0.032**	**0.075**	**0.022**	**0.070**	**0.022**
Rural Forest	-0.007	0.025	**0.150**	**0.017**	0.034	0.019
Constant	-0.2447	0.317	**-1.180**	**0.235**	-0.313	0.259

Notes: The coefficients are marginal probabilities. Number of observations = 3516; Wald $\chi^2(99)$ = 1082.58; Prob > χ^2 = 0.000; Log likelihood = -4088.398; Pseudo-R^2 = 0.135. **Bold:** Statistically significant at 5 percent; underline: Statistically significant at 10 percent; *cursive*: Statistically significant at 15 percent; standard errors are robust Huber-White Sandwich standard errors, White (1980).

Table C3. Determinants of Children's' Activities in Ghana, GLSS4

	Coeff.	Std.error	Z-statistic	P-value
Individual characteristics:				
Age	0.020	0.020	1.04	0.296
Age squared	-0.001	0.001	-0.78	0.433
Female	-0.002	0.008	-0.26	0.794
Child of household	-0.790	0.163	-4.77	0.000
Parent Characteristics:				
Mother lives in household	0.065	0.024	4.16	0.000
Father lives in household	0.115	0.064	3.24	0.001
Household Characteristics:				
Children 0-6 years	0.017	0.008	3.73	0.000
Brothers 7-14 years	-0.010	0.007	-1.56	0.120
Sister 7-14 years	-0.003	0.006	-0.50	0.618
Males 15-59 years	-0.003	0.006	-0.52	0.606
Females 15-59 years	-0.000	0.005	-0.04	0.967
Older than 60	0.005	0.016	0.28	0.777
Muslim	-0.020	0.009	-3.60	0.000
Christian	-0.423	0.178	-4.05	0.000
No religion	-0.016	0.008	-3.09	0.002
(Log) per capita expenditure	-0.021	0.010	-2.92	0.003
Male head of household	-0.102	0.067	-2.78	0.005
Age of household head	-0.004	0.002	-1.80	0.071
Age of household head squared	4.25E-5	2.03E-5	1.97	0.048
Land	-0.001	0.008	-0.13	0.895
Cost of Schooling:				
Schooling expenditure	3.27E-7	1.43E-7	3.19	0.001
Distance (in minutes)	-0.000	0.000	-0.78	0.437
Location:				
Other urban	0.527	0.118	5.70	0.000
Rural Coastal	0.996	0.004	8.77	0.000
Rural Forest	0.295	0.070	5.56	0.000

Notes: The coefficients are marginal probabilities. The locational dummy for Accra as well as the dummy for livestock ownership, "other religion" and parents' education had to be omitted due to collinearity, number of observations = 443; Wald $\chi^2(25) = 125.38$; Prob > $\chi^2 = 0.000$; Log likelihood = -73.259; Pseudo-$R^2 = 0.618$; standard errors are robust Huber-White Sandwich standard errors, White (1980).

Appendix D: Predictions

Table D1. Predictions, GLSS1

Variable	School only	School and work	Work only	Neither
Full sample	34.1	13.7	25.1	27.1
Girls	33.2	11.0	23.8	32.0
Boys	35.0	16.3	26.2	22.6
Child of the household	35.3	13.0	25.2	26.5
Not child of the household	30.9	15.8	24.6	28.8
Mother no education	31.8	13.7	27.2	27.4
Mother primary	38.6	17.0	15.7	28.8
Mother middle secondary	44.0	12.9	17.8	25.3
Mother some post-secondary	45.5	4.6	36.4	13.6
Father no education	28.2	12.1	30.0	29.7
Father primary	53.0	8.7	20.0	18.3
Father middle secondary	40.0	17.3	18.2	24.5
Father some post-secondary	40.8	17.8	17.1	24.3
Across expenditure quintiles:				
Lowest	35.9	12.1	23.4	28.7
Next-to-lowest	33.0	14.1	25.0	27.8
Middle	34.5	13.6	24.9	27.1
Next-to-highest	33.8	15.1	25.2	25.9
Highest	33.0	14.3	28.1	24.6

Table D2. Predictions, GLSS3

Variable	School only	School and work	Work only	Neither
Full sample	31.6	17.6	18.1	32.8
Girls	30.1	16.8	16.6	36.5
Boys	32.8	18.3	19.4	29.5
Child of the household	31.3	16.3	18.1	34.3
Not child of the household	32.8	22.9	18.1	26.2
Mother no education	28.0	16.2	19.2	36.6
Mother primary	43.2	21.5	16.8	18.5
Mother middle secondary	46.0	24.5	12.6	16.8
Mother some post-secondary	45.7	11.4	5.7	37.1
Father no education	25.1	13.9	20.7	40.3
Father primary	38.6	24.0	15.0	22.4
Father middle secondary	39.5	24.5	15.1	21.0
Father some post-secondary	51.3	16.7	9.2	22.8
Across expenditure quintiles:				
Lowest	27.6	15.4	18.4	38.6
Next-to-lowest	30.9	17.5	17.8	33.9
Middle	31.7	19.2	18.4	30.6
Next-to-highest	32.4	18.6	18.4	30.7
Highest	37.7	17.9	17.2	27.2

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Summary Findings

While the issue of child labor in developing countries has received increased attention in recent years, most of the empirical analysis has been based on one-time cross sectional samples. While this may give an idea of the incidence and determinants of child labor at one point in time, it is silent about the dynamics of child labor over time and sometimes may even be influencing policy choices against child labor adversely. This paper attempts to fill this void, analyzing the dynamics of child labor and schooling in Ghana, aiming at investigating the impact of broad economic reforms on child labor and schooling in the short, medium and long run. Starting from a premise that the simple — direct — relationship between poverty and child labor, which has often been seen as the feature of child labor, may not adequately capture the multi facetted nature of child labor, we find evidence of asymmetries in the child labor-poverty link, as well as quite complex dynamics in the evolution of child labor and schooling and their determinants over time. Most notably, child labor is found to be responsive to poverty in the short run, but not in the long run, while child schooling is unaffected by poverty in short run but responds in the medium- to long run. These results suggest that child labor acts as an economic buffer of the household in the short run, regardless of changes in the economic environment or perceptions of the latter following economic reforms, thus supporting — and refining — the poverty explanation of child labor.

HUMAN DEVELOPMENT NETWORK